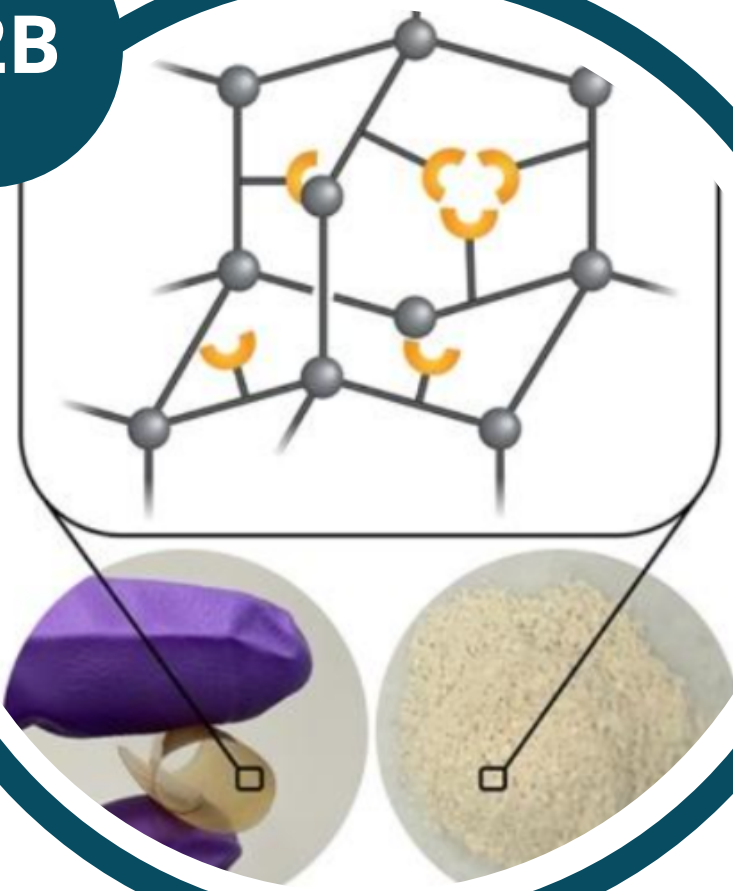


POROUS POLYMER SORBENTS

Dynamic, advanced materials to replace mercury in the gold mining process

B2B



This porous sorbent and membrane materials have the potential to selectively capture heavy metals like gold and mercury. This technology provides environmentally responsible solutions for small-scale gold mining that both extract gold without needing mercury and capture waste mercury from aquatic ecosystems.

The team aims to make water remediation and precious metal recovery more energy-efficient, utilizing precision separations based on the uniquely tailored chemistry and porosity of their proprietary materials.

CLEANER MINING TOOL

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Problem

Artisanal and small-scale gold miners use and release six metric tons of mercury from the gold mining process into the environment every day. Gold mining activities can leave sites contaminated with mercury after operations. When this hazardous material enters the environment, it creates tremendous health risks to ecosystems and people.

Solution

Porous polymer network (PPN) sorbent and membrane materials that replace mercury in the gold mining process, providing an environmentally friendly and nontoxic method to recover gold. Additionally, PPNs can serve as a precision-level purification platform to remove toxic or precious metals from water (e.g., Hg or Au) without the need of heavy machinery or infrastructure.

Market

The main customers are industrial wastewater treatment facilities and/or mining companies interested in deploying sustainable innovation at point of use for cheaper, easier methods of water remediation and metal extraction.



In partnership with the CITE Minero, these selective porous materials are being tested on alluvial deposits from Madre de Dios, Peru through their participation in the Amazon CoLab

Company

The team has received research awards from the National Alliance for Water Innovation (NAWI), the National Science Foundation (NSF), the American Institute of Chemical Engineers (AIChE), the North American Membrane Society (NAMS), and the American Water Works Association (AWWA).

They have also received support from the Breakthrough Energy Fellows Program to scale up these materials for their use in sustainable processes.

Competitive Landscape

Existing companies that sell specialized sorbents (e.g., DuPont, Purolite) or membranes (e.g., LG Chem).

Porous Polymer Sorbents' materials have four times higher adsorption capacities than commercial sorbents, higher microporous surface areas, and rapid kinetics due to high porosities. The main value proposition of these materials is that they provide ion-ion selectivity for precision separations with excellent performance, which competing technologies do not provide.

Funding Needs

Continued support and partnerships in prototyping and field-testing products for artisanal and small-scale gold mining applications, among other markets.



The Artisanal Mining Grand Challenge: The Amazon is implemented by Conservation X Labs in partnership with the United States Agency for International Development (USAID), the Gordon and Betty Moore Foundation, Microsoft, and Esri. The Challenge seeks to advance innovation solutions that make artisanal and small scale mining more environmentally responsible and socially equitable.

www.artisanalminingchallenge.com

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